



OIPE

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/022,249

DATE: 02/05/2002

TIME: 14:19:13

Input Set : N:\jumbos\022249

Output Set: N:\CRF3\02052002\J022249.raw

ENTERED

4 <110> APPLICANT: Vega, Manuel
 5 Drittanti, Lila
 7 <120> TITLE OF INVENTION: HIGH THROUGHPUT DIRECTED EVOLUTION BY RATIONAL MUTAGENESIS
 9 <130> FILE REFERENCE: 37851-911
 C--> 11 <140> CURRENT APPLICATION NUMBER: US/10/022,249
 C--> 12 <141> CURRENT FILING DATE: 2001-12-17
 14 <150> PRIOR APPLICATION NUMBER: 60/315,382
 15 <151> PRIOR FILING DATE: 2001-08-27
 17 <160> NUMBER OF SEQ ID NOS: 735
 19 <170> SOFTWARE: FastSEQ for Windows Version 4.0
 21 <210> SEQ ID NO: 1
 22 <211> LENGTH: 621
 23 <212> TYPE: PRT
 24 <213> ORGANISM: Artificial Sequence
 26 <220> FEATURE:
 27 <223> OTHER INFORMATION: Mutant rep protein: rep78 4 GCT
 29 <400> SEQUENCE: 1
 30 Thr Ala Gly Ala Tyr Glu Ile Val Ile Lys Val Pro Ser Asp Leu Asp
 31 1 5 10 15
 32 Glu His Leu Pro Gly Ile Ser Asp Ser Phe Val Asn Trp Val Ala Glu
 33 20 25 30
 34 Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile
 35 35 40 45
 36 Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu Gln Arg Asp Phe Leu
 37 50 55 60
 38 Thr Glu Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val
 39 65 70 75 80
 40 Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Met His Val Leu Val Glu
 41 85 90 95
 42 Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg Phe Leu Ser Gln Ile
 43 100 105 110
 44 Arg Glu Lys Leu Ile Gln Arg Ile Tyr Arg Gly Ile Glu Pro Thr Leu
 45 115 120 125
 46 Pro Asn Trp Phe Ala Val Thr Lys Thr Arg Asn Gly Ala Gly Gly Gly
 47 130 135 140
 48 Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn Tyr Leu Leu Pro Lys
 49 145 150 155 160
 50 Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn Met Glu Gln Tyr Leu
 51 165 170 175
 52 Ser Ala Cys Leu Asn Leu Thr Glu Arg Lys Arg Leu Val Ala Gln His
 53 180 185 190
 54 Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Gln Asn
 55 195 200 205

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56 Pro Asn Ser Asp Ala Pro Val Ile Arg Ser Lys Thr Ser Ala Arg Tyr
57      210      215      220
58 Met Glu Leu Val Gly Trp Leu Val Asp Lys Gly Ile Thr Ser Glu Lys
59 225      230      235      240
60 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
61      245      250      255
62 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
63      260      265      270
64 Ile Met Ser Leu Thr Lys Thr Ala Pro Asp Tyr Leu Val Gly Gln Gln
65      275      280      285
66 Pro Val Glu Asp Ile Ser Ser Asn Arg Ile Tyr Lys Ile Leu Glu Leu
67      290      295      300
68 Asn Gly Tyr Asp Pro Gln Tyr Ala Ala Ser Val Phe Leu Gly Trp Ala
69 305      310      315      320
70 Thr Lys Lys Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
71      325      330      335
72 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Thr Val Pro
73      340      345      350
74 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp
75      355      360      365
76 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
77      370      375      380
78 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
79 385      390      395      400
80 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
81      405      410      415
82 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
83      420      425      430
84 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
85      435      440      445
86 Glu Leu Thr Arg Arg Leu Asp His Asp Phe Gly Lys Val Thr Lys Gln
87      450      455      460
88 Glu Val Lys Asp Phe Phe Arg Trp Ala Lys Asp His Val Val Glu Val
89 465      470      475      480
90 Glu His Glu Phe Tyr Val Lys Lys Gly Gly Ala Lys Lys Arg Pro Ala
91      485      490      495
92 Pro Ser Asp Ala Asp Ile Ser Glu Pro Lys Arg Val Arg Glu Ser Val
93      500      505      510
94 Ala Gln Pro Ser Thr Ser Asp Ala Glu Ala Ser Ile Asn Tyr Ala Asp
95      515      520      525
96 Arg Tyr Gln Asn Lys Cys Ser Arg His Val Gly Met Asn Leu Met Leu
97      530      535      540
98 Phe Pro Cys Arg Gln Cys Glu Arg Met Asn Gln Asn Ser Asn Ile Cys
99 545      550      555      560
100 Phe Thr His Gly Gln Lys Asp Cys Leu Glu Cys Phe Pro Val Ser Glu
101      565      570      575
102 Ser Gln Pro Val Ser Val Val Lys Lys Ala Tyr Gln Lys Leu Cys Tyr
103      580      585      590
104 Ile His His Ile Met Gly Lys Val Pro Asp Ala Cys Thr Ala Cys Asp

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105          595          600          605
106 Leu Val Asn Val Asp Leu Asp Asp Cys Ile Phe Glu Gln
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109 <210> SEQ ID NO: 2
110 <211> LENGTH: 536
111 <212> TYPE: PRT
112 <213> ORGANISM: Artificial Sequence
114 <220> FEATURE:
115 <223> OTHER INFORMATION: Mutant rep protein: rep68 4 GCT
117 <400> SEQUENCE: 2
118 Thr Ala Gly Ala Tyr Glu Ile Val Ile Lys Val Pro Ser Asp Leu Asp
119 1 5 10 15
120 Glu His Leu Pro Gly Ile Ser Asp Ser Phe Val Asn Trp Val Ala Glu
121 20 25 30
122 Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile
123 35 40 45
124 Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu Gln Arg Asp Phe Leu
125 50 55 60
126 Thr Glu Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val
127 65 70 75 80
128 Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Met His Val Leu Val Glu
129 85 90 95
130 Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg Phe Leu Ser Gln Ile
131 100 105 110
132 Arg Glu Lys Leu Ile Gln Arg Ile Tyr Arg Gly Ile Glu Pro Thr Leu
133 115 120 125
134 Pro Asn Trp Phe Ala Val Thr Lys Thr Arg Asn Gly Ala Gly Gly Gly
135 130 135 140
136 Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn Tyr Leu Leu Pro Lys
137 145 150 155 160
138 Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn Met Glu Gln Tyr Leu
139 165 170 175
140 Ser Ala Cys Leu Asn Leu Thr Glu Arg Lys Arg Leu Val Ala Gln His
141 180 185 190
142 Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Gln Asn
143 195 200 205
144 Pro Asn Ser Asp Ala Pro Val Ile Arg Ser Lys Thr Ser Ala Arg Tyr
145 210 215 220
146 Met Glu Leu Val Gly Trp Leu Val Asp Lys Gly Ile Thr Ser Glu Lys
147 225 230 235 240
148 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
149 245 250 255
150 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
151 260 265 270
152 Ile Met Ser Leu Thr Lys Thr Ala Pro Asp Tyr Leu Val Gly Gln Gln
153 275 280 285
154 Pro Val Glu Asp Ile Ser Ser Asn Arg Ile Tyr Lys Ile Leu Glu Leu
155 290 295 300
156 Asn Gly Tyr Asp Pro Gln Tyr Ala Ala Ser Val Phe Leu Gly Trp Ala

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157 305          310          315          320
158 Thr Lys Lys Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
159          325          330          335
160 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Thr Val Pro
161          340          345          350
162 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp
163          355          360          365
164 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
165          370          375          380
166 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
167 385          390          395          400
168 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
169          405          410          415
170 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
171          420          425          430
172 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
173          435          440          445
174 Glu Leu Thr Arg Arg Leu Asp His Asp Phe Gly Lys Val Thr Lys Gln
175          450          455          460
176 Glu Val Lys Asp Phe Phe Arg Trp Ala Lys Asp His Val Val Glu Val
177 465          470          475          480
178 Glu His Glu Phe Tyr Val Lys Lys Gly Gly Ala Lys Lys Arg Pro Ala
179          485          490          495
180 Pro Ser Asp Ala Asp Ile Ser Glu Pro Lys Arg Val Arg Glu Ser Val
181          500          505          510
182 Ala Gln Pro Ser Thr Ser Asp Ala Glu Ala Ser Ile Asn Tyr Ala Asp
183          515          520          525
184 Arg Leu Ala Arg Gly His Ser Leu
185          530          535
187 <210> SEQ ID NO: 3
188 <211> LENGTH: 621
189 <212> TYPE: PRT
190 <213> ORGANISM: Artificial Sequence
192 <220> FEATURE:
193 <223> OTHER INFORMATION: Mutant rep protein: rep78 10 GCG
195 <400> SEQUENCE: 3
196 Thr Ala Gly Phe Tyr Glu Ile Val Ile Ala Val Pro Ser Asp Leu Asp
197 1 5 10 15
198 Glu His Leu Pro Gly Ile Ser Asp Ser Phe Val Asn Trp Val Ala Glu
199 20 25 30
200 Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile
201 35 40 45
202 Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu Gln Arg Asp Phe Leu
203 50 55 60
204 Thr Glu Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val
205 65 70 75 80
206 Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Met His Val Leu Val Glu
207 85 90 95
208 Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg Phe Leu Ser Gln Ile

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209		100		105		110
210	Arg	Glu	Lys	Leu	Ile	Gln
211				115		120
212	Pro	Asn	Trp	Phe	Ala	Val
213				130		135
214	Asn	Lys	Val	Val	Asp	Glu
215				145		150
216	Thr	Gln	Pro	Glu	Leu	Gln
217				165		170
218	Ser	Ala	Cys	Leu	Asn	Leu
219				180		185
220	Leu	Thr	His	Val	Ser	Gln
221				195		200
222	Pro	Asn	Ser	Asp	Ala	Pro
223				210		215
224	Met	Glu	Leu	Val	Gly	Trp
225				225		230
226	Gln	Trp	Ile	Gln	Glu	Asp
227				245		250
228	Ser	Asn	Ser	Arg	Ser	Gln
229				260		265
230	Ile	Met	Ser	Leu	Thr	Lys
231				275		280
232	Pro	Val	Glu	Asp	Ile	Ser
233				290		295
234	Asn	Gly	Tyr	Asp	Pro	Gln
235				305		310
236	Thr	Lys	Lys	Phe	Gly	Lys
237				325		330
238	Thr	Thr	Gly	Lys	Thr	Asn
239				340		345
240	Phe	Tyr	Gly	Cys	Val	Asn
241				355		360
242	Cys	Val	Asp	Lys	Met	Val
243				370		375
244	Lys	Val	Val	Glu	Ser	Ala
245				385		390
246	Val	Asp	Gln	Lys	Cys	Lys
247				405		410
248	Ile	Val	Thr	Ser	Asn	Thr
249				420		425
250	Thr	Thr	Phe	Glu	His	Gln
251				435		440
252	Glu	Leu	Thr	Arg	Arg	Leu
253				450		455
254	Glu	Val	Lys	Asp	Phe	Phe
255				465		470
256	Glu	His	Glu	Phe	Tyr	Val
257				485		490

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/022,249

DATE: 02/05/2002

TIME: 14:19:14

Input Set : N:\jumbos\022249

Output Set: N:\CRF3\02052002\J022249.raw

L:11 M:270 C: Current Application Number differs, Replaced Current Application Number

L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date